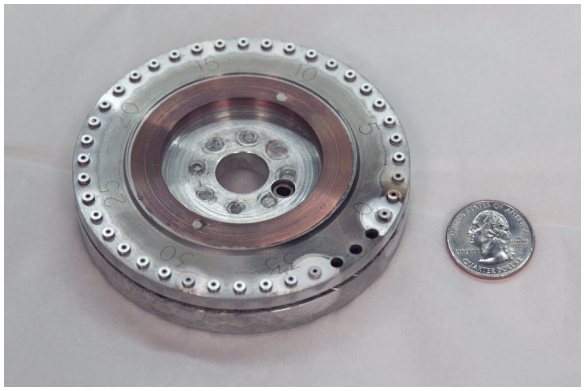
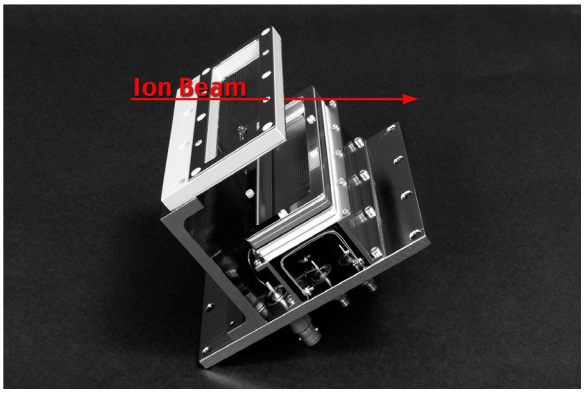
TRACE ELEMENT ACCELERATOR MASS SPECTROMETRY



40 Sample holder for ^{14}Carbon Analysis



Microchannel Plate Detector Position Sensitive

Trace element accelerator mass spectrometry at the Naval Research Laboratory (NRL) combines two powerful tools for composition measurement into a unique analytical capability. A commercial secondary ion mass spectrometer (SIMS) is combined with an accelerator mass spectrometer.This modification overcomes molecular interference and a noise floor in SIMS to enable detection of sub part per billion concentrations of trace impurities, even in complex matrices, with a lateral resolution of about 10 μm. A truly unique feature is the instrument's ability to measure multiple trace elements in parallel over a factor of eight range of mass at once. The instrument is also capable of measuring isotopic compositions in bulk samples, such as ^{14}C. This tool offers unique capabilities in the analysis of novel electronic materials, geologic minerals, and valuable limited samples. For example, TEAMS could produce a fingerprint of trace elements, and be used to identify the source of a material interest. Initial work at NRL has included analysis of methane hydrate samples collected from the seafloor.

Point of Contact
Naval Research Laboratory
4555 Overlook Avenue, SW • Washington, DC 20375-5343

Kenneth S. Grabowski • Materials Science and Technology Division • (202) 767-5738
e-mail • grabowski@nrl.navy.mil